[MUSIC PLAYING]

[CHIMES]

SARAH TOBACCO: Sublimation. The physical transformation of a solid into a gas without intermediate melting to the liquid is called sublimation. While this particular phase transformation only occurs with solids that have appreciable vapor pressure below the melting point, in these cases, it can sometimes be used as a purification technique.

This video will illustrate the atmospheric pressure sublimation of ferrocene. While sublimation can also be carried out under reduced pressure, the basic principles and steps are the same, so a reduced pressure sublimation will not be demonstrated.

Sublimation can occur when a compound has appreciable vapor pressure below its melting point. In certain cases, sublimation can be used as a purification technique in the laboratory. It only works when a compound can undergo sublimation and subsequent condensation without decomposition. It is also essential that none of the impurities in the sample sublime under the same conditions.

And atmospheric pressure sublimation setup is very simple. It consists of a hot plate, the bottom of a culture dish containing the impure sample, the lid of the culture dish, and an ice bath. It's really that simple.

Start by transferring your impure sample to the culture dish. Spread it out so that it is no more than 5 millimeters thick at any point.

Place the sample on the hot plate and top it with the lid. Set the ice bath on the lid and turn the heat on very low. Be patient, sublimation takes time.

[ALARM]

GUEST SPEAKER: Caution, overheating will destroy your material. But it's a good way to make road tar.

SARAH TOBACCO: With a little patience and the right conditions, you will soon observe formation of crystals on the lid of the culture dish. Let a layer of crystals grow and then turn off the heat. Let the setup cool down a little bit before you gently slide the ice bath off of the lid.

[ALARM]

GUEST SPEAKER: Caution, if you're not careful, you'll lose your crystals.

SARAH TOBACCO: Careful the lid might stick to the bath which can be disastrous. If you were careful enough, you can now lift the lid and see the layer of beautiful, purified crystals. Scrape the crystals into a clean watch glass and marvel over the dramatic improvement over your initial sample.

I know it doesn't look like a lot of crystals, but remember, this is just the first batch. Replace the lid on the culture dish, top it with the ice bath, and turn the heat back on to harvest another batch of beautiful crystals. Repeat these steps until you have purified all of your compound.

Remember, this video is intended to help you prepare for lab by providing a demonstration of the proper experimental technique. It is not intended as a replacement for reading your lab manual or the supplementary material. In order to become a great experimentalist, it is important that you understand both theory and technique. Now it's your turn, good luck.

[MUSIC PLAYING]